

REQUEST TO REDESIGNATE
Boyd County, Kentucky
LOCATED WITHIN THE
ASHLAND-HUNTINGTON, KY-WV, MSA
8-HOUR OZONE NONATTAINMENT AREA



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May 2006

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INTRODUCTION

The Ashland-Huntington, Kentucky-West Virginia, Metropolitan Statistical Area (MSA) was designated in a *Federal Register* notice on April 30, 2004 (*Appendix A*), as a nonattainment area for the 8-hour National Ambient Air Quality Standard (NAAQS), effective June 15, 2004. The Commonwealth of Kentucky requests that the United States Environmental Protection Agency (U.S. EPA) redesignate the Boyd County, Kentucky, portion of the Ashland-Huntington, KY-WV MSA to attainment for the 8-hour ozone standard pursuant to 107(d)(3) of the 1990 Clean Air Act Amendments (CAAA). The MSA consists of Boyd County, Kentucky, and Wayne and Cabell Counties, West Virginia. The state of West Virginia is separately submitting a request that their respective portion of this nonattainment area be redesignated to attainment.

In accordance with section 110(k) of the Clean Air Act Amendments of 1990, Kentucky's request to amend the SIP is based on the most recent three years of monitoring data showing no additional violations of the 8-hour ozone standard for the 2003-2005 time period, and a calculated ozone design value for 2003-2005 data that is attaining the NAAQS. Implementation of permanent and enforceable reductions in ozone precursor emissions have occurred and are discussed later in this document.

This redesignation request was prepared in accordance with U.S. EPA Guidance issued in 1992, in memorandums on June 23 and September 4 from John Calcagni (*Appendix B*), and additional guidance provided by memorandum on September 17, 1993, from Michael H. Shapiro (*Appendix B*).

BACKGROUND

The Clean Air Act Amendments of 1990 (CAAA) establish a process for air quality management through the NAAQS. Area designations are required after promulgation of a new or revised NAAQS. On July 18, 1997, U.S. EPA promulgated a revised ozone standard of 0.08 parts per million (ppm), measured over an 8-hour period. The 8-hour standard is more protective of public health and more stringent than the previous 1-hour standard. The NAAQS rule was challenged by numerous litigants and in May 1999, the U.S. Court of Appeals for the D.C. Circuit issued a decision remanding, but not vacating, the 8-hour standard. Among other things, the Court recognized that U.S. EPA is required to designate areas for any new or revised NAAQS in accordance with the CAA and addressed a number of other issues, which are not related to designations.

In February 2001, the Supreme Court upheld U.S. EPA authority to set the NAAQS and remanded the case back to the D.C. Circuit for disposition of issues the Court did not address in its initial decision. The Supreme Court also remanded the 8-hour implementation strategy to U.S. EPA. In March 2002, the D.C. Circuit rejected all remaining challenges to the 8-hour ozone standard.

The process for designations following promulgation of a NAAQS is contained in section 107(d)(1) of the CAA. The Transportation Equity Act for the 21st Century (TEA-21) extended by 1 year the time for U.S. EPA to designate areas for the 8-hour NAAQS. Thus, U.S. EPA was required to designate areas for the revised ozone standard by July 2000. However, U.S. EPA's appropriations bill in 2000 restricted the agency's authority to spend money or designate areas

until June 2001 or the date of the Supreme Court ruling on the standard, whichever came first. As noted earlier, the Supreme Court decision was issued in February 2001.

In 2003, several environmental groups filed suit in district court claiming U.S. EPA had not met its statutory obligation to designate areas for the 8-hour NAAQS. U.S. EPA entered into a consent decree, which required U.S. EPA to issue the designations by April 15, 2004. In accordance with Section 107(d)(1) of the CAAA, the *Federal Register* notice was published on April 30, 2004, and designated the Ashland-Huntington, Kentucky and West Virginia, MSA to be nonattainment for the 8-hour ozone NAAQS, effective June 15, 2004 (*Appendix A*).

IMPROVEMENT IN AIR QUALITY

The 8-hour ozone nonattainment designation was based on air quality data collected from 2001 through 2003 that exceeded the specified NAAQS level of 0.08 parts per million (ppm). In 2004 the ambient ozone data for Boyd County in the Kentucky portion of the nonattainment area indicated a downward trend in ozone concentrations, but still a continued violation of the 8-hour standard with a 3-year design value of 0.086 ppm. Monitors in the remainder of the region were already demonstrating attainment at that time. However, the 2005 data for the Boyd County monitor resulted in a decline in the design value to within attainment levels for the most recent three-year period (2003-2004-2005). The design value is 0.079 ppm. The ambient data report is included in *Appendix C*.

Table 1 is a summary of the number of days annually, in which the 8-hour NAAQS for ozone (0.08 parts per million) was exceeded in Boyd County, Kentucky. The monitor is located at 2924 Holt Street in Ashland, Kentucky, and is operated by the Ashland Regional Office staff.

TABLE 1.
SUMMARY OF 8-HOUR OZONE EXCEEDANCES THAT OCCURRED ANNUALLY

County	2000	2001	2002	2003	2004	2005
Boyd	0	2	22	6	0	1

The table below is a summary of the calculated design value of for the 8-hour ozone NAAQS for Boyd County, Kentucky. Table 2. shows the overall downward trend in the 3-year average (ppm) for the last four years.

TABLE 2.
ANNUAL 4TH MAX HIGH AND DESIGN VALUE FOR 8-HOUR OZONE (PARTS PER MILLION)

4th MAX Value	(ppm)
1995	0.091
1996	0.079
1997	0.086
1998	0.077
1999	0.094
2000	0.079
2001	0.085
2002	0.102
2003	0.088
2004	0.068
2005	0.082
3-yr Avg.	(ppm)
1995-97	0.085
1996-98	0.080
1997-99	0.085
1998-00	0.083
1999-01	0.086
2000-02	0.088
2001-03	0.091
2002-04	0.086
2003-05	0.079

The collected data was quality-assured in accordance with 40 CFR 58 and was recorded in the U.S. EPA Air Quality System (AQS). It is anticipated that this monitor, located on residential property and operated by our staff, will remain at its current location for the foreseeable future.

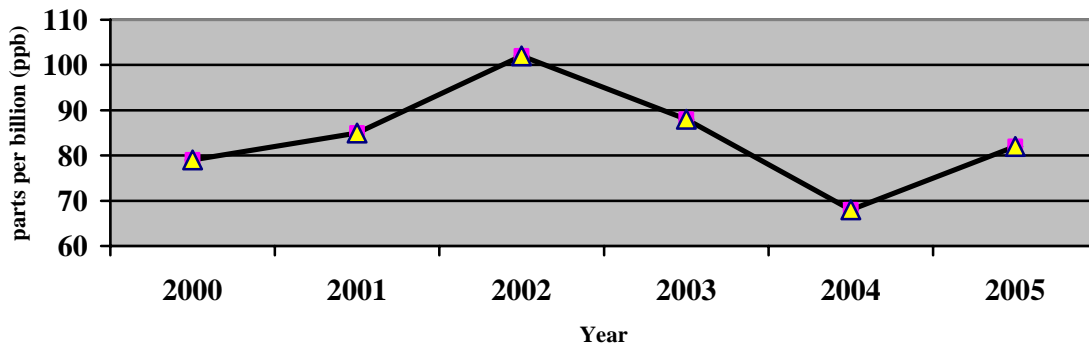
For this SIP revision, Kentucky first developed a Baseline Emissions Inventory for the Boyd County nonattainment area. This baseline emissions inventory is included in *Appendix D*. The year 2002 was chosen as the base year for developing a comprehensive ozone precursor emissions inventory for which projected emissions could be developed for 2004, 2005, 2008, 2011, 2014, 2017, and 2018. This projected emissions inventory is included in *Appendix I*. Kentucky chose 2004 as the attainment year. The three-year period (2003-2005) has a calculated 8-hour ozone design value of 0.079 ppm.

PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS

The improvement in air quality in the Ashland-Huntington, KY-WV, MSA ozone nonattainment area, as verified by the lower design value, is due to the implementation of permanent and enforceable emission reductions. Certainly the favorable pattern of weather conditions (*Appendix E*) contributed to the lower levels of ozone formations, however Kentucky is able to identify significant permanent and enforceable reductions that occurred as well during this very short timeframe of 2002-2005.

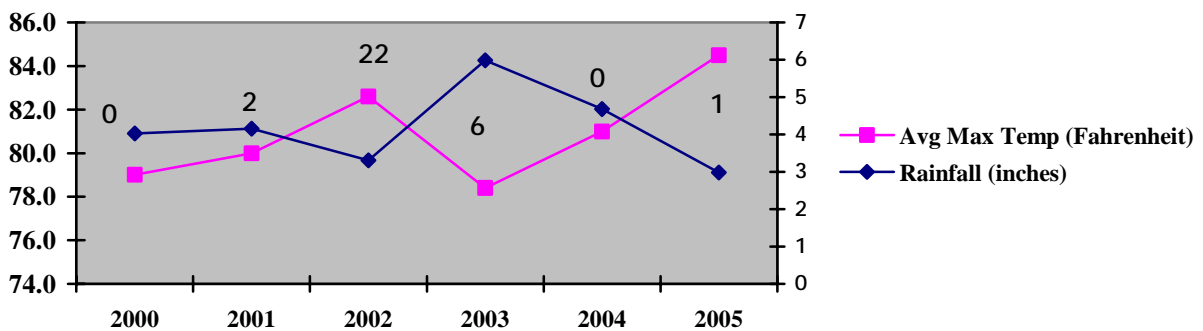
A thorough review of air monitoring data over the last six years shows an overall decline in annual ozone values throughout the region, with the exception of 2002 (*Graph 1*).

Graph 1.
Annual 4th Max High Trend for 8-Hour Ozone

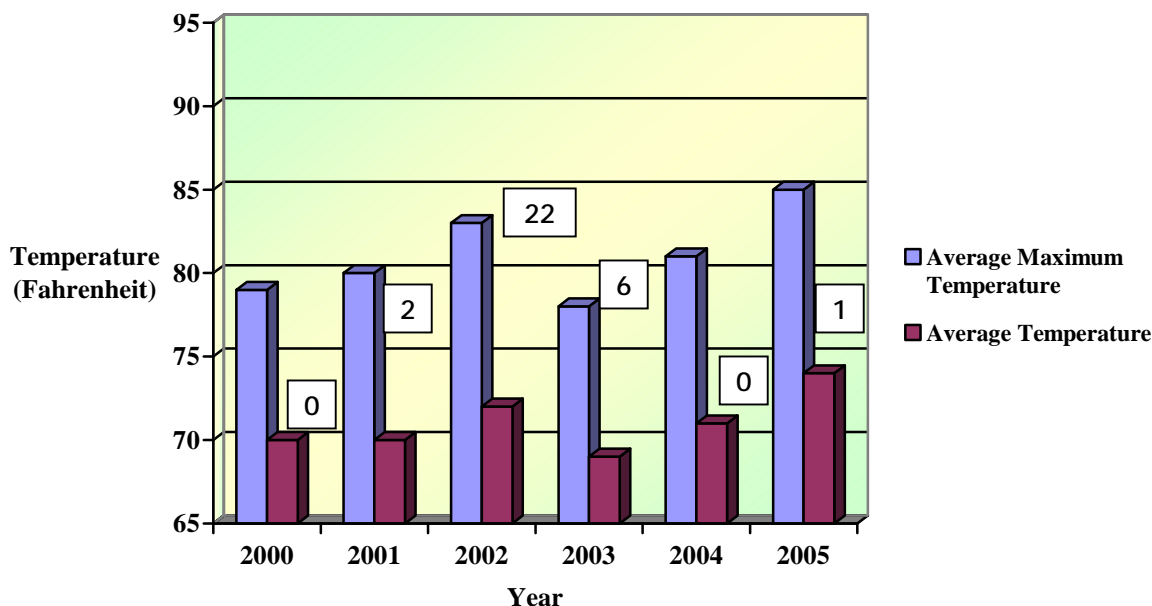


General meteorological information including temperatures and rainfall for years 2000 through 2005 is depicted below in Graph 2 and Graph 3. This information is representative of the months of May through September, the months with typically high ozone levels in Kentucky. As depicted by these graphs, there appears to be no meteorological anomaly associated with any of the past six years. Note that although there were 22 ozone exceedances in 2002, that period experienced moderate rainfall and moderate maximum average monthly temperature for the period under review. Average maximum temperature ranges for the summer ozone season have remained consistent, within 6° for the six-year period. Therefore, emission reductions within the region have contributed to lessening ozone levels, not meteorological events.

Graph 2. Boyd County, Kentucky, Average Maximum Temperature & Average Rainfall (Annually for May through September)



**Graph 3. Boyd County, Kentucky,
Average Maximum and Average Temperatures Annually for May through September with
respective number of ozone exceedances**



Emission reductions (in tons per day, or tpd) described below are from various programs and initiatives. The next section discusses categories of sources that have shown, or are expected to show, emission reductions in volatile organic compounds (VOCs), carbon monoxide (CO), and oxides of nitrogen (NO_x) emissions due to regulatory measures implemented, both by the U.S. EPA and the Commonwealth of Kentucky.

For this SIP revision, Kentucky chose to use 2002 as the base year for developing a comprehensive ozone precursor emissions inventory for which certain projected emissions could be developed for 2004, 2005, 2008, 2011, 2014, 2017, and 2018. Kentucky chose 2004 as the attainment year. The three-year period (2003-2005) brings the design value into attainment with a calculated value of 0.079 ppm.

2001-2005 EMISSION REDUCTION PROGRAMS

The following information outlines emission reduction measures that have occurred from 2001 through 2005.

HIGHWAY MOBILE SOURCE REDUCTIONS

Federal Motor Vehicle Control Programs (FMVCP)

Permanent and enforceable reductions have been and continue to be achieved each year through this program. In recent years, stricter federal requirements have been imposed on automobile manufacturers for improved fuel-efficiency and extended warranties for emission control devices. Documentation of these emission reductions is contained in the highway mobile modeling runs (*Appendix H*).

Lower Reid Vapor Pressure

The 1990 Clean Air Act Amendments mandated that the Reid Vapor Pressure (RVP) of gasoline decrease from 10.5 pounds per square inch (psi) in 1988 to 9.0 psi in 1990 during the ozone season. A 1992 National Institute for Petroleum and Energy Research (NIPER) study indicated that an 8.6 psi RVP was more accurate for Kentucky for those counties with reformulated gasoline (RFG). This results in slightly lower VOC emissions if compared to using a 9.0 RVP. However, Boyd County does not use RFG. Thus with USEPA concurrence from Dale Aspy through a telephone call with Joe Forgacs on March 14, 2000, Kentucky used 9.0 as input for the highway model (i.e., Mobile6.2). Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix H*).

Fleet Turnover of Automobiles

Permanent and enforceable emission reductions have occurred in the Ashland-Huntington, KY-WV, MSA nonattainment area as a result of fleet turnover of automobiles. As older, less efficient automobiles are replaced by newer, more efficient models, the emissions decrease on a per mile basis. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix H*).

Tier 2 Vehicle Emissions and Fuel Standards

Permanent and enforceable reductions have occurred through this program. The overall Tier 2 program focuses on reducing the passenger car and light truck emissions most responsible for causing ozone. In 2004, the Tier 2 standards began to phase in for the first time a single set of federal tailpipe emission standards that apply to all passenger cars, light trucks, and larger passenger vehicles (including sport utility vehicles, minivans, vans, and pickup trucks) operated on any fuel. In 2007, when the new standards will be fully phased in, U.S. EPA projects that nationwide NO_x reductions from cars and trucks will be 856,471 tons per year (tpy). U.S. EPA further projects a NO_x reduction of 1,236,000 tpy by 2010, and reductions reaching an estimated 2,220,00 tpy in 2020. Quantification of these reductions for Kentucky is contained in the highway mobile model runs (*Appendix H*).

Heavy-Duty Engine and Vehicle and Fuel Standards

Permanent and enforceable reductions will occur through this program. This program will result in particulate matter and NO_x emission levels that are 90 percent and 95 percent below the standard levels in effect today, respectively. The rule mandates a 97 percent reduction in the

sulfur content of diesel fuel. Additionally, the cap for sulfur in regular gasoline will be reduced to 80 ppm and most refineries must produce gasoline averaging no more than 30 ppm sulfur in 2006. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix H*).

POINT SOURCE EMISSION REDUCTIONS

Reasonably Available Control Measures (RACM)

401 KAR 50:012, Section 1(2) requires that all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available, and practical.” See *Appendix F* for the full text of 401 KAR 50:012.

Maximum Available Control Technology (MACT)

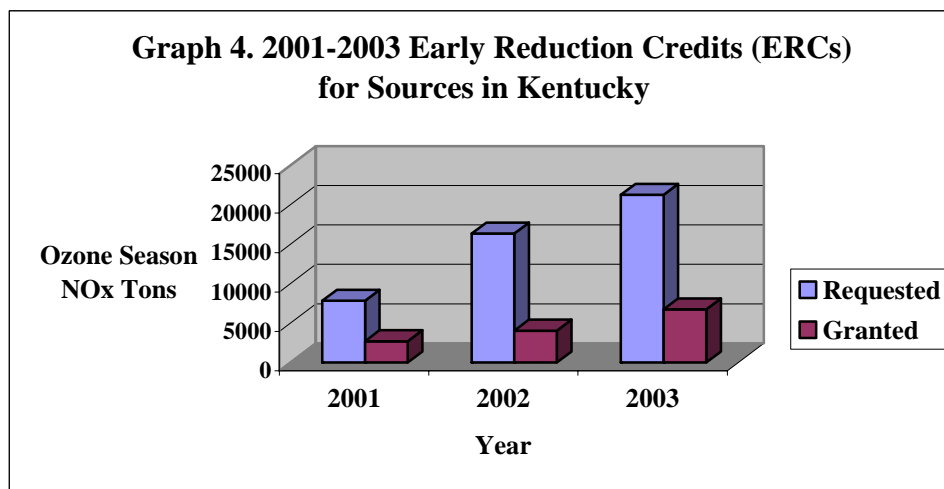
The Clean Air Act requires U.S. EPA to review and update its lists of categories of industries that emit one or more of 188 listed toxic air pollutants, or Hazardous Air Pollutants (HAPS). For listed categories of major industrial sources, the law requires U.S. EPA to develop standards requiring those industries to achieve emission reduction equivalent to putting into place what is known as “maximum achievable control technology” (MACT). Many of the HAPS under these industrial categories of controls are also VOCs, and compliance with these new MACT standards as they are being promulgated will decrease VOC emissions from the affected industries. Additionally, U.S. EPA is now promulgating residual risk requirements for some point and area source categories. These requirements will further reduce VOC emissions.

Additional Reductions - NOx SIP Call Reductions

Although Kentucky is not claiming credit for these source reductions regarding the attainment status of the county, it is important to note ongoing and significant emission trends of any ozone precursors (ie., NO_x) that occurred during the current 2002-2005 years of ozone monitoring data.

The NO_x emission reductions achieved from the NO_x SIP Call throughout the entire region and the state of Kentucky, effective May 2004, will contribute to the area's continued maintenance of the 8-hour ozone standard and future compliance with the ozone NAAQS.

In accordance with Kentucky regulation 401 KAR 51:180, the Division had determined from Kentucky's compliance supplement pool that electric-generating units (EGUs) had 13,469 tons available for Early Reduction Credits (ERCs). Of the 13,469 tons for EGUs, 20% (2,694) was available for emission reductions achieved in 2001, 30% (4,041) was available for emission reductions achieved in 2002, and the remaining 50% (6,734) was available for emission reductions in 2003. Per 401 KAR 51:180, the ERCs were used for compliance with NO_x emission standards in 401 KAR 51:160 during the 2004 and 2005 control period. However, overall the sources in each year, requested allowances for a much larger number of ozone season NO_x tons reductions. Referring to the graph below, you can compare the annual source reductions to the allowances actually available under the NO_x SIP Call. These reductions benefited the nonattainment area and demonstrate on-going NO_x emission reductions throughout the state.



AREA SOURCE CONTROLS

None noted.

NON-HIGHWAY MOBILE SOURCE REDUCTIONS

Until the mid-1990s, emissions from non-highway engines were largely uncontrolled. The non-highway category includes outdoor power equipment, recreational vehicles (ie., scooters, mopeds, all-terrain bikes, snowmobiles, etc.), marine vessels, personal watercraft, farm and construction machinery, lawn and garden equipment, locomotives, and many other applications. Certain federal rules have been implemented since the early 1990's that have resulted in permanent and enforceable emission reductions from these nonroad sources.

Implemented during the 2002-2005 timeframe were:

Small spark-ignition engines – This set of emissions standards for handheld applications (such as leaf blowers and chainsaws) phases in 2002 – 2007 and will result in an additional 70 percent reduction in hydrocarbons and NO_x.

Large spark-ignition engines – In 2004, these emission standards began phasing in to reduce NO_x and CO for many applications of industrial equipment, including forklifts, airport service equipment, generators, compressors, and welders.

Locomotives – The Tier 1 emissions standards apply to locomotives and locomotive engines manufactured from 2002 through 2004, and will reduce NO_x emissions by two thirds as new engines are placed in service.

Land-based diesel engines – More stringent standards to reduce NO_x emissions apply to all engine sizes and are being phased in between 2001 – 2006. Included in this change is construction equipment such as backhoes, agricultural equipment such as tractors, material handling equipment such as heavy forklifts, industrial equipment such as airport service vehicles, and utility equipment such as generators and pumps.

These reductions were determined using the U.S. EPA's nonroad model and are reflected in the emissions provided in this document (*Appendix G*).

MAINTENANCE PLAN

Section 107(d)(3)(e) of the Clean Air Act Amendments of 1990 (CAAA) mandates that for an area to be redesignated to attainment, the U.S. EPA must approve a maintenance plan that meets the requirements of Section 175A. The maintenance plan must constitute a SIP revision and provide for maintenance of the air quality in an affected area for at least 10 years after redesignation. Kentucky has chosen to project emissions through the year 2018, which is 12 years after attainment.

The maintenance plan includes: an emissions inventory for the base year (2002); projected inventories for the attainment year 2004, interim years 2005, 2008, 2011, 2014, 2017, and the end year 2018; a commitment to maintain the existing ambient monitoring system; and contingency measures that may be put in place should the area have subsequent violations of the 8-hour ozone standard.

2002 BASE YEAR EMISSIONS INVENTORY

Since this is a newly designated nonattainment area, a base year inventory had not yet been submitted to U.S. EPA. A Base Year Emissions Inventory for 2002 for Boyd County, Kentucky, in the Ashland-Huntington, KY-WV, 8-Hour Ozone Nonattainment Area is being submitted to the U.S. EPA (*Appendix D*). Documentation of the methodologies of the development of this inventory are also included in that appendix.

Kentucky believes the inventory submitted in this document to be a comprehensive inventory of actual emissions for the Kentucky portion of the area and the best basis for which to make any future projections. The 2002 base year maintenance area emissions inventory methodology and documentation is included as *Appendix D*.

EMISSION PROJECTION METHODOLOGY

One of the planning elements listed in the Calcagni memorandum from September 1992 (*Appendix B*) that is required for attainment redesignation purposes is developing a projection inventory that indicates the area will remain in attainment and which includes emission projections for at least ten years after U.S. EPA's official redesignation approval. Kentucky's

projection inventory through the year 2018, and the methodology for performing that inventory, is located in *Appendix I*.

The attainment year for Boyd County is 2004. Kentucky used actual 2002 and 2004 emissions for point sources. The inventory projected both the area source emissions and the locomotive portion of the non-highway emissions from the 2002 Base Year Inventory to the 2004 attainment year. Emissions for the base year, the attainment year, and all interim years for highway mobile were developed using U.S. EPA's MOBILE6.2 mobile emissions model. Nonroad emissions were modeled using U.S. EPA's Nonroad Emissions Model for 2002. The emissions inventory thus developed for 2002 was used to project emissions for the interim years.

A maintenance demonstration requires comparison of the projected emissions inventory with the baseline inventory. If the projected emissions remain at or below the baseline emissions, there is a demonstration of maintenance. If, however, the projected emissions are above the baseline, then additional measures are required to ensure the projected emissions will remain at or below the baseline emissions.

Tables detailing the category projection inventories for VOC, CO, and NO_x emissions for the attainment year 2004, and years 2005, 2008, 2011, 2014, 2017, and 2018 are included for Boyd County in *Appendix I*. Biogenic emissions have been excluded from these projection tables. Biogenic emissions for the base year 2002 can be found in *Appendix D*. Based on information received from EPA, biogenic emissions are expected to remain stable throughout the projection period.

Tables 3 through 5 show the projection of emissions through 2018. Boyd County's projected 2018 total emissions for NO_x are below the 2004 total emissions. However the VOC trend projection is slightly upward due to the Bureau Economic Analysis (BEA) growth factors applied to the point source category (*Appendix I*). The major point source affected is the refinery. It is important to note that Catlettsburg Refining L.L.C. is undergoing a project entitled the Refinery Modernization Project. Modifications to the facility permit, effective March 2004, have decreased overall VOCs emissions for the area.

These overall facility emission reductions have the potential to reduce growth in VOC emissions that resulted from applying the BEA growth indicators to the projection calculations for the point source category. Additional detail, and a link to the refinery permit, are included on pages 20-21.

Table 4 and the carbon monoxide portion of Table 6 are not used to set budgets, but are included for informational purposes only.

TABLE 3.
BOYD COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED VOC EMISSIONS
(TONS PER DAY)
2004-2018

COUNTY	2004	2005	2008	2011	2014	2017	2018
POINT	17.52	17.76	18.49	19.09	19.81	20.54	20.79
AREA	2.97	2.97	2.97	2.97	2.97	2.97	2.97
HIGHWAY*	2.50	2.28	1.91	1.63	1.38	1.23	1.18
NON-HWY	0.71	0.68	0.61	0.56	0.55	0.56	0.56
TOTAL	23.70	23.69	23.98	24.25	24.71	25.30	25.50

*Calculated using MOBILE 6.2

TABLE 4.
BOYD COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED CO EMISSIONS
(TONS PER DAY)
2004-2018

COUNTY	2004	2005	2008	2011	2014	2017	2018
POINT	101.97	102.70	104.94	107.24	109.59	111.98	112.79
AREA	1.55	1.55	1.55	1.55	1.55	1.55	1.55
HIGHWAY*	25.17	22.83	19.18	17.20	15.76	15.11	14.92
NON-HWY	9.83	10.02	10.36	10.59	10.80	11.17	11.32
TOTAL	138.52	137.10	136.03	136.58	137.70	139.81	140.58

*Calculated using MOBILE 6.2

TABLE 5.
BOYD COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED NOX EMISSIONS
(TONS PER DAY)
2004-2018

COUNTY	2004	2005	2008	2011	2014	2017	2018
POINT	16.17	16.35	16.90	17.37	17.92	18.48	18.68
AREA	0.09	0.10	0.10	0.10	0.10	0.10	0.10
HIGHWAY*	3.79	3.60	2.98	2.36	1.79	1.41	1.30
NON-HWY	1.83	1.81	1.71	1.63	1.54	1.48	1.47
TOTAL	21.89	21.86	21.69	21.46	21.35	21.47	21.55

*Calculated using MOBILE 6.2

The emissions inventory is broken down into four components: point, area, highway mobile, and non-highway mobile sources. Using 2004 as the attainment year, the subsequent years were chosen at three-year or longer intervals and project maintenance for at least a 10-year period pending approval of the revision of the SIP. Necessary calculations for the projections were made using EXCEL software. A description of how growth factors for each emission category were obtained and used follows. The documentation showing how emissions were grown is included in *Appendix I*.

Point Source Projections – Boyd County

For this inventory purpose, point sources are defined as stationary sources that emit 10 tons or more per year (tpy) of VOC, or 100 tpy or more of NO_x or CO. Emissions are calculated from data collected annually from point sources. The 2002 point source information was developed using the Division's existing emissions inventory database (ie., TEMPO). The existing TEMPO database was updated using questionnaires and annual surveys completed by the sources and quality assured by division personnel.

Utilizing Standard Industrial Codes (SIC), all point source emission projections were based on growth factors calculated using Bureau of Economic Analysis (BEA) projection data for employment, as suggested by the U.S. EPA and as utilized for previous point source projections approved by U.S. EPA. The point source data provided SIC codes used to determine a short title description that matched the corresponding description found in the BEA data. The application of growth factors for each projection was then used for point sources. *Appendix I* provides information on how point source projections were determined.

Area Source Projections – Boyd County

Area sources can be defined as those sources that are generally too small and/or too numerous to be handled individually in the point source inventory. Emissions are estimated by multiplying an emission factor by a known indicator of collective activity such as number of employees or population. For area source emission projections, population growth factors for each chosen year were calculated using an exponential formula in the EXCEL software. The application of these growth factors for each projection was then used for area sources. Information used to

calculate growth factors, including population information used to project area sources was provided by the University of Louisville Urban Data Center and can be found in *Appendix I*.

Non-Highway Mobile Source Projections – Boyd County

The non-highway mobile category is broken down into three groups that include 2 and 4-cycle gasoline engines and diesel engines (other non-highway engines), railroad locomotives, and aircraft. Emissions are estimated by multiplying the base year inventory by a known indicator of collective activity such as fuel consumed or landing/takeoff operations. For locomotive and aircraft emission projections, population growth factors for each chosen year were calculated using the before mentioned formula. The application of these growth factors for each projection was then used for each of these non-highway categories. For other non-highway categories (e.g., industrial equipment, tractors, leaf blowers), the U.S. EPA's nonroad model (Core Model Version 2005a, February 2006) was used to determine the future year projections. Nonroad model and non-highway projection information can be found in *Appendix I*. Updated minimum and maximum summer temperatures and ambient temperatures were utilized for input into the nonroad model. EPA Volume IV mobile source guidance was followed in determining the updated temperature data. See the baseline inventory in *Appendix D* for specific temperature documentation.

Highway Mobile Source Projections - Boyd County

To calculate future highway mobile source emissions in Table 6, the Division obtained data on Daily Vehicle Miles Traveled (DVMT) and speeds for 2002, 2004, 2005, 2008, 2011, 2014, 2017, and 2018 from the Kentucky Transportation Cabinet (*Appendix I*). The Division ran U.S. EPA's MOBILE6.2 model, the latest highway mobile source emission factor estimation modeling software approved by U.S. EPA, to derive appropriate projection year emission factors

that were multiplied by the corresponding DVMT to determine the projected highway mobile source emissions. These data and documentation on how these projections were performed can be found in *Appendix H*, including MOBILE6.2 input and output files used to compute the highway mobile source 2002 emissions and subsequent emission projections for 2002, 2004, 2005, 2008, 2011, 2014, 2017, and 2018. Baseline inventory documentation in *Appendix D* provides the minimum and maximum summer temperatures that were used for the highway mobile source calculations. For required regional emissions analysis (i.e., for 2018 and beyond) for this maintenance area, the applicable budget for the purposes of conducting transportation conformity analyses for Boyd County will be the 2018 VOC (1.18 tpd) and NO_x (1.30 tpd) motor vehicle emissions budget.

TABLE 6.
BOYD COUNTY 8-HOUR OZONE MAINTENANCE AREA
HIGHWAY MOBILE SOURCE PROJECTED EMISSIONS
(TONS PER DAY)
2004-2018

POLLUTANT	2004	2005	2008	2011	2014	2017	2018
VOC	2.50	2.28	1.91	1.63	1.38	1.23	1.18
NO _x	3.79	3.60	2.98	2.36	1.79	1.41	1.30
CO*	25.17	22.83	19.18	17.20	15.76	15.11	14.92

*DOES NOT APPLY TO MOBILE BUDGETS

TOTAL OF ALL EMISSIONS

It is important to recognize the differences between the 2002 tpd base year levels and the projected tpd levels for each pollutant for the year 2018. Table 7 below shows that the county's projected 2018 emissions for CO and NO_x are less than the 2004 attainment year emissions. The VOC emissions for 2018 are greater than the 2004 attainment year but less than the 2003 base year. Recognizing the slight increase in VOCs, it is important to note that Catlettsburg Refining, L.L.C. is undergoing a project entitled the Refinery Modernization Project, which involves new

operational and emissions limitations. The proposed Refinery Modernization Project involves installation of new equipment and upgrading of existing equipment. This will allow the refinery to produce cleaner-burning transportation fuels, to improve yields, to utilize a wider range of purchased feed materials, and to reduce fixed and operating costs. In addition, the project will substantially reduce emissions of SO₂ and NO_x from the refining operations mainly due to the fact that the new catalytic cracker will now be subject to much more stringent New Source Performance Standards; there will be VOC emission reductions as well but not as great as for SO₂ and NO_x.

The following actual emission reductions are expected to occur by 2006:

PM	- 33 tons per year (decrease)
PM ₁₀	- 33 tons per year (decrease)
SO ₂	- 3,605 tons per year (decrease)
NO _x	- 730 tons per year (decrease)
CO	- 4 tons per year (decrease)
VOC	- 64 tons per year (decrease)

The most recent modification to the permit that requires these limitations was issued June 4, 2004, and can be found on the Kentucky Division for Air Quality website at:

<http://www.air.ky.gov/NR/ronlyres/6EB5FA41-A66E-4097-A763-7936B5FB6EFF/0/DraftR2.pdf>

These emission reductions resulting from the Refinery Modification Project were not reflected in our DAQ point source emissions database for either 2002 or 2004, and thus were not reflected in the point source inventory data used in this submittal for the base year and the attainment year.

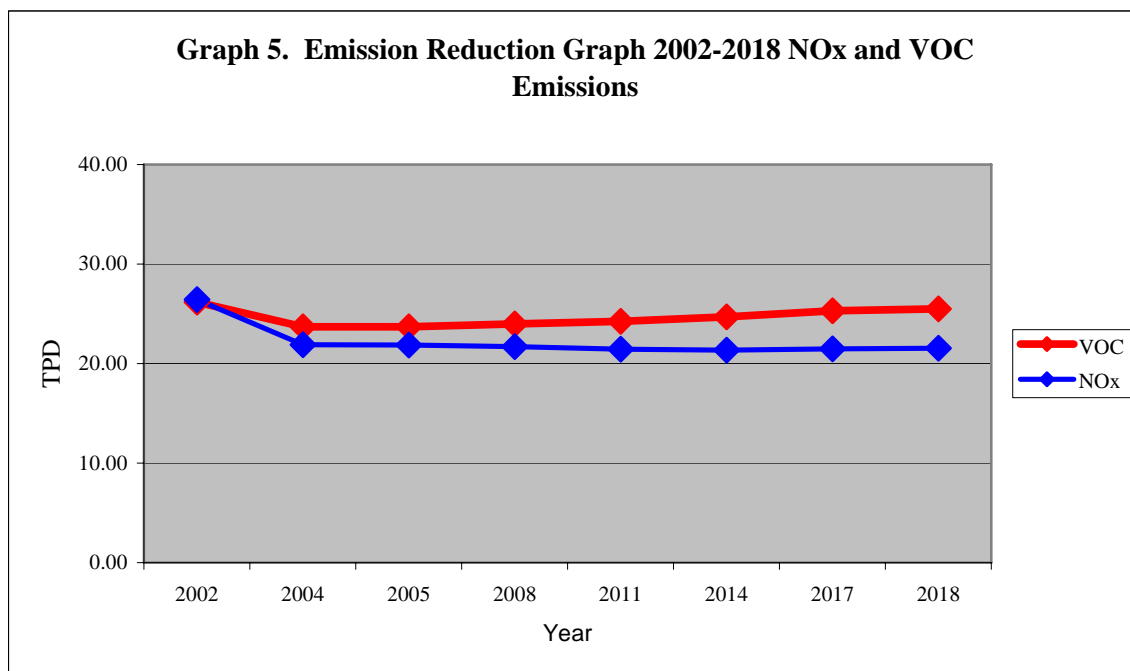
Although Kentucky is not claiming credit for these refinery reductions regarding the attainment status of the county, it is important to note ongoing and significant emission trends of any ozone precursors (ie., NO_x and VOC) that occurred during the current 2003-2006 years of ozone monitoring data. These data trends will be further quantified and documented during the triennial assessment of emissions.

The refinery emission reductions achieved from the Modification Project, effective March 2004, will contribute to the area's continued maintenance of the level of emissions that allowed for attainment of the 8-hour ozone standard and future compliance with the ozone NAAQS.

TABLE 7.
BOYD COUNTY 8-HOUR OZONE MAINTENANCE AREA
2002 – 2004 – 2018 EMISSIONS COMPARISONS
TOTAL EMISSIONS (TONS PER DAY)

SOURCE CATEGORY	2002			2004			2018		
	VOC	CO	NO _x	VOC	CO	NO _x	VOC	CO	NO _x
POINT	19.74	175.09	20.29	17.52	101.97	16.17	20.79	112.79	18.68
AREA	2.81	1.21	0.09	2.97	1.55	0.10	2.97	1.55	0.10
HIGHWAY MOBILE	2.86	29.87	4.21	2.50	25.17	3.79	1.18	14.92	1.30
NON-HWY MOBILE	0.76	9.49	1.85	0.71	9.83	1.83	0.56	11.32	1.47
TOTAL EMISSIONS	26.17	215.66	26.44	23.70	138.52	21.89	25.50	140.58	21.55

The following graph illustrates the overall trend in VOC and NO_x emissions for Boyd County from 2002 through the attainment year 2004, and projected emissions through 2018.



PLAN TO MAINTAIN AIR QUALITY

The Commonwealth of Kentucky and U.S. EPA have instituted programs that will remain enforceable and are hereby submitted as a plan to maintain air quality which meets the NAAQS for the 8-hour ozone standard. Following the redesignation of the area, sources are prohibited from reducing emission controls already in place when attainment was achieved.

- ☞ All new major VOC or NOx sources locating in Kentucky shall as a minimum apply control procedures that are reasonable, available, and practical;
- ☞ All major modifications to existing major VOC or NOx sources are subject to RACM requirements as well as the BACT requirement of the DAQ PSD regulations;
- ☞ Federal Motor Vehicle Control Standards apply in Kentucky;
- ☞ Transportation conformity;
- ☞ Prevention of Significant Deterioration requirements;
- ☞ Federal Controls on certain nonroad engines (e.g. diesel and other fuel requirements, industrial diesel equipment, locomotives) after 2000;
- ☞ Federal controls on the VOC content for Architectural and Maintenance Paints, Auto Body Shops, and Consumer Products;

In addition to these measures, further reductions will be achieved throughout the continued implementation of new federal regulations to further control the emission of Hazardous Air

Pollutants that are VOCs (40 *Code of Federal Regulations* 63, NESHAPS). Also, on March 10, 2005, the U.S. EPA finalized the Clean Air Interstate Rule (CAIR). NO_x emissions from power plants will be cut by 1.7 million tons by 2009 and emissions will be reduced by 1.3 million tons in 2015 in 28 eastern states and the District of Columbia. These reductions cannot be quantified at this time, but will be reflected in future assessments.

EXISTING MONITORING NETWORK

In addition to the maintenance plan discussed above, the existing ozone monitor located within Boyd County, in the Kentucky portion of the Huntington-Ashland Ozone Nonattainment area, has been approved by the U.S. EPA. The monitor will continue to remain operational in accordance to 40 CFR 58.

CONTINGENCY MEASURES

Future reviews of actual emissions for this redesignated area will be performed using the latest emission factors, models, and methodologies. For these periodic inventories, the Commonwealth will review the assumptions made for the purpose of the maintenance demonstration concerning projected growth of activity levels. If any of these assumptions appear to have changed substantially, the Commonwealth will re-project emissions.

In the event that a measured value of the fourth highest maximum is 0.87 ppm or greater in any portion of the maintenance area in a single ozone season, or if periodic emission inventory updates reveal excessive or unanticipated growth greater than 10% in ozone precursor emissions,

the state will evaluate existing control measures to see if any further emission reduction measures should be implemented at that time.

In the event of a monitored violation of the 8-hour ozone NAAQS standard in the Huntington-Ashland nonattainment area, the Commonwealth commits to adopt, within nine months, one or more of the following contingency measures to re-attain the standard. All regulatory programs will be implemented within 18 months.

- ✓ Implementation of a program to require additional emission reductions on stationary sources;
- ✓ Implementation of a program to enhance inspection of stationary sources to ensure emission control equipment is functioning properly;
- ✓ Open burning restrictions during ozone season;
- ✓ High-volume, low-pressure spray guns and low VOC degreaser solvents;
- ✓ Implementation of incentives for alternative fuels programs;
- ✓ Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles;
- ✓ Trip-reduction ordinances;
- ✓ Employer-based transportation management plans, including incentives;
- ✓ Programs to limit or restrict vehicle use in downtown areas, or other areas of emission concentration, particularly during periods of peak use;
- ✓ Programs for new construction and major reconstructions of paths or tracks for use by pedestrians or by non-motorized vehicles when economically feasible and in the public interest.

The Commonwealth also reserves the right to implement other contingency measures if new control programs should be developed and deemed more advantageous for the area.

Section 175A(b) of the Clean Air Act requires that eight years after formal redesignation, the state continues to provide for maintenance of the standard for an additional ten years. If this requirement remains applicable for this area, the Commonwealth commits to submit to U.S. EPA a plan for future maintenance of the standard in Boyd County as required.

PUBLIC PARTICIPATION

Kentucky conducted a public hearing to receive comments on this proposed SIP revision to redesignate Boyd County on July 20, 2006, at the FIVCO Area Development District, 3000 Louisa Street, Catlettsburg, Kentucky. A copy of the public hearing notice and a copy of the advertisement is included in *Appendix J*.

A copy of the Environmental and Public Protection Cabinet's responses to comments received during that public review period is included as *Appendix K*.

APPENDIX SUMMARY

APPENDIX A – *FEDERAL REGISTER*, VOL. 69, NO. 84, APRIL 30, 2004, “AIR QUALITY DESIGNATIONS AND CLASSIFICATIONS FOR THE 8-HOUR OZONE NAAQS”

APPENDIX B – USEPA MEMORANDUM FROM JOHN CALCAGNI, JUNE 23, 1992, “SUBJECT: PROCESSING OF SIP SUBMITTALS,” AND USEPA MEMORANDUM FROM JOHN CALCAGNI, SEPTEMBER 4, 1992, “SUBJECT: PROCEDURES FOR PROCESSING REQUESTS TO REDESIGNATE AREAS TO ATTAINMENT,” AND USEPA MEMORANDUM FROM MICHAEL H. SHAPIRO, SEPTEMBER 17, 1993, “SIP REQUIREMENTS FOR AREAS SUBMITTING REQUESTS FOR REDESIGNATION TO ATTAINMENT OF THE OZONE NAAQS ...”

APPENDIX C – AQS/USEPA DATABASE, “2000-2005 AMBIENT 8-HOUR OZONE DATA FOR BOYD COUNTY”

APPENDIX D – 2002 BASELINE EMISSIONS INVENTORY METHODOLOGY AND DOCUMENTATION, AND APPENDICES A THROUGH F

APPENDIX E – METEOROLOGICAL DATA PROVIDED BY THE UNIVERSITY OF KENTUCKY AGRICULTURAL WEATHER CENTER

APPENDIX F – 401 KAR 50:012 RACM

APPENDIX G – NON-HIGHWAY MOBILE RUNS

APPENDIX H – MOBILE MODEL RUNS AND DOCUMENTATION

APPENDIX I – EMISSIONS PROJECTIONS INVENTORY METHODOLOGY AND DOCUMENTATION

APPENDIX J- NOTICE OF PUBLIC HEARING AND LEGAL DOCUMENTATION

APPENDIX K– STATEMENT OF CONSIDERATION